

Requirements for the Ethylene MACT

Fugitive Emissions

40 CFR Part 63 Subpart UU

§63.1019 - §63.1039

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Presentation Overview

- **Review key definitions**
- **Review MACT UU (Equipment Leaks) Applicability**
- **Review MACT YY (Ethylene MACT) Applicability Assessment Methods**
- **Summarize MACT UU Equipment Leak Requirements**
- **Summarize MACT UU Reporting and Record keeping requirements**



63 subpart YY Applicability Provisions

In Table 7 @ § 63.1103(e):

For Equipment as Defined at Sec 63.1101 that contains or contacts organic HAP	The equipment contains contains or contacts ≥ 5 weight-percent organic HAP and the equipment is not in vacuum service	Comply with the requirements of 63 subpart UU.
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Compliance during shutdowns

- **Compliance is required at all times except when lines are drained and depressurized.**

Key Definitions

- **Equipment is defined in subpart YY in §63.1101.**
- **Ethylene Production or production unit is defined in subpart YY at §63.1103(e)(2)**



Summary of 63 subpart UU Applicability

- **At §63.1019 the following exemptions are provided:**
 - **Equipment in vacuum service**
 - **Equipment in service < 300 hrs/yr**
 - **Lines and equipment not containing process fluids**



Equipment Leaks: Applicability Assessment Procedures (subpart YY)

- **The owner must demonstrate the each piece of equipment is **not** in organic HAP service.**
- **Equipment is presumed to be in HAP service unless the owner provides this demonstration**

Applicability Assessment – subpart YY

- **To be considered not in HAP service, the expected organic HAP content must not exceed 5 wgt % on an annual average basis.**
- **If analytical methods are used, Method 18 is required.**

Applicability Assessment – subpart YY

- **An owner may use good engineering judgment rather than analytical procedures to determine HAP content**

Summary of subpart UU

- **Equipment identification requirements are provided at § 63.1022 and are:**
 - **Equipment needs to be identified via physical tagging or via a plant site plan, log entries, by designation of process unit or affected facility boundaries by a weather proof identification or other appropriate method.**



Equipment Identification – subpart UU

- **Connectors need not be individually identified if all connectors in a designated area or length of pipe are identified as a group and the number of connectors is indicated.**
- **Connectors need to be identified no later than the completion of the initial monitoring survey.**

Equipment Identification – subpart UU

- **Identify equipment routed to a process or fuel gas system or equipment routed to a closed vent system and control device.**
- **Identify pressure relief devices equipped with rupture disks.**
- **Identify instrumentation systems subject to visual, audio or olfactory monitoring.**



Equipment Identification – subpart UU

- **Identify equipment in service less than 300 hrs per year.**
- **Identify equipment that is unsafe or difficult to monitor**
 - **In a new source, difficult to monitor valves are limited to 3 %.**
 - **The plan to monitor this equipment at least annually is required**



Equipment Identification – subpart UU

- **Identify connectors that are unsafe to repair.**
- **Identify compressors operating with an instrument reading of less than 500 ppm**
- **Retain the information, data and analysis used to determine that equipment is in heavy liquid service.**



Valve LDAR Requirements

- **For Valves in gas/Vapor or light liquid service:**
 - The leak definition is 500 ppm. An owner may group the valves into subgroups for % leaker calcs per the rules @ 40 CFR 63.1025(b)(4)
 - After an initial check, if the percent leaking valves is $\geq 2\%$ or at least 2 valves, the source must monitor monthly
 - If the percent leaking valves is $< 2\%$ and < 2 valves, whichever is greater, the source may monitor quarterly

Valve LDAR Requirements

- If the percent leaking valves is $< 1\%$, the source may monitor once every 2 quarters.
- If the percent leaking valves is $< 0.5\%$, the source may monitor once per year.
- If the percent leaking valves is $< 0.25\%$, the source may monitor once every 2 years.



Valve % Leaker Calculations

- When determining the monitoring frequency for each process unit or valve subgroup, the percent leaking valves from the last two monitoring periods shall be averaged to determine the frequency for < semi annual monitoring.

Valve % Leaker Calculations

- When determining monitoring frequency for each process unit or valve subgroup subject to annual or biennial (once every 2 years) monitoring frequencies, the percent leaking valves shall be the arithmetic average of the percent leaking valves from the last three monitoring periods.

Valve % Leaker Calculations

- Non-repairables are included in the calculation the first time they occur.
- After the first time, they can be excluded.
 - There is an upper limit of 1 % on this exclusion.
 - The number above 1 % must be included.

Pumps (light liquid) & Agitators

- **Weekly visual checks are required (with records)**
- **A leak is 5000 ppm for polymerizing monomers, 2000 ppm for food and medical service and 1000 ppm for other pumps.**
 - **For 1000 ppm pumps, a repair attempt is not required until 2000 ppm**
- **An agitator leak is 10,000 ppm**
- **Monthly OVA checks (initially completed by the compliance deadline).**

Notes on the Compliance Date

- **The nominal compliance date is 3 years from July, 12, 2002.**
- **The actual compliance date is August 1, 2005 per §63.1108(d)(2)(i) & (ii)**



Pumps (light liquid) & Agitators

- If the % leaking pumps is $\geq 10\%$ on a six month rolling average or if 3 or more pumps are leaking (whichever is greater), the owner must implement a Quality Improvement Program. See § 63.1035 for details.
- The equipment is exempt from periodic OVA checks if equipped with a dual mechanical seal with a barrier fluid system or a shaft that does not penetrate the seal housing.

Pumps (light liquid) & Agitators

- **Equipment is also exempt from routine OVA checks if equipped with a closed vent seal system routed back to the seals, a process or a control device.**

Connectors

- **A leak is defined as 500 ppm**
- **After an initial OVA compliance check within one year of the compliance date, ongoing OVA checks are required per:**
 - **If the % leaking connectors is ≥ 0.5 %, the source must monitor connectors once per year.**

Connectors

- **If the % leaking connectors is ≥ 0.25 % and < 0.5 %, the source may monitor connectors once every four years, provided 40 % of connectors are monitored during the first two years.**
- **If the % leaking connectors is < 0.35 %, the source may monitor connectors once every 8 years.**

Connectors

- **50 % of connectors must be checked within the first 4 years and**
- **If the % leaking connectors is ≥ 0.35 %, the source must complete the monitoring within the next 6 months and re-establish a monitoring frequency.**

Closed Vent Systems and Control Devices

Equipment	Leak Prevention Standard	Repair Requirement
Closed Vt Syst. & contr. Dev; Emissions routed to fuel gas system or process	Hard Piped: Conduct initial OVA (leaks > 500 ppm) Conduct annual visual, auditory, olfactory leak check	First attempt 5 days, Final 15 days

Closed Vent Systems and Control Devices

- Note – there are separate monitoring requirements for closed vent systems using duct work.
- These are found in subpart SS §63.983 and are not discussed here
- Subparts YY and UU do not required hard piped closed vent systems.

Compressors

Leak Prevention Standard	Repair Requirement
Equip with a barrier fluid seal system meeting § 63.1031 design Standards or Operate < 500 ppm based on annual checks	First attempt 5 days, Final 15 days

Open Ended Valves or Lines

Leak Prevention Standard § 63.1033	Repair Requirement
Equip with a cap, blind flange or second valve that seals the line when not in use except for valves or lines which contain material which may pose a safety hazard and valves designed to open as part of an emergency shutdown system	None

Pressure Relief Devices in Gas/Vapor Service

Leak Prevention Standard § 63.1030	Repair Requirement
Install a rupture disk upstream of the PRV or Operate with an OVA reading of < 500 ppm VOC	After pressure release, demonstrate < 500 ppmv within 5 days After release, install a new rupture disk within 5 days, if previously equipped.

Heavy Liquid Service Equipment PRV's in Liquid Service, Inst. Systems

Leak Prevention Standard § 63.1029	Repair Requirement
If evidence of a leak is found by visual, auditory, olfactory or other, OVA monitoring is required within 5 days	OVA monitoring is not required if all indications of leak are eliminated within 5 days and repair is verified by soap bubble or pressure test

Heavy Liquid Service Equipment

PRV's in Liquid Service, Inst. Systems

Leak Prevention Standard § 63.1029	Repair Requirement
Leaks exist when: ≥5000 ppm pumps (monomer service) ≥2000 ppm all other pumps ≥500 ppm for valves, conn, PRV's, Inst Systems ≥10,000 ppm for agitators	First attempt – 5 days Final Repair – 15 days

Sampling Connection Systems

Leak Prevention Standard § 63.1032	Repair Requirement
Equip with closed purge, closed loop, or closed vent system to capture sample purge and route process fluid to 1. Process 2. Fuel Gas System 3. Subpart UU compliant control device or waste or waste water management unit as spec @ § 63.1032(c)(4)	None

Recordkeeping

- Recordkeeping requirements are found at §63.1038 which is provided in the notes.



Recordkeeping

General equipment leak records required are:

- General & specific equipment identity
- Written plan for difficult and unsafe to monitor
- Identity of Compressors operating at < 500 ppmv
- Records of the determination of Heavy Liquid equipment

Recordkeeping

- Maintain a record of the identity and explanation for any equipment that is unsafe to repair.
- Maintain records of leaking equipment for 5 years and connectors for 5 years beyond last use (8 + 5 or 13 years).

Recordkeeping

- Keep leak repair records
- Keep delay of repair records
- Specific equipment leak records are provided at §63.1038(c)
 - See notes for slide 31.

Reporting Requirements

- Reporting Requirements are found at §63.1039 which is included in the notes.
- Note 63.1039(b)(4) – for PRV's and compressors subject to < 500 ppm all monitoring data is required to be reported.

Initial Notification

- The initial notification shall be postmarked within one year of July 12, 2002 for existing sources or within one year of applicability for new sources.
- For equipment leaks, the initial notification must identify the process units subject to equipment leak rules.

Initial Compliance Status Report

- Due 240 days after July 12, 2005 or by March 9, 2006
- Content of the initial compliance status report for Fugitive emissions is given at §63.1039(a)(1) – (3)

Periodic Reports

- Due no later than 60 days after the end of each 6 month compliance period.
- First report is due on the last day of the month that includes the date 8 months after the initial compliance status report.

Periodic Reports

- Content for periodic reports is given at §63.1039(b)
 - See notes for slide 36.

The End

- Questions?

